

Appl. No. 09/945,393

In th Specification

Please replace paragraph [0025] with the following replacement paragraph:

[0025] Although the principles described herein are indicated as particularly applicable to $[(Ta_2O_5)] Ta_2O_5$ dielectric materials, the invention may be further applicable to other dielectric materials containing tantalum and oxygen, as well as dielectric materials not containing tantalum and/or oxygen. Accordingly, in another aspect of the invention, a dielectric forming method includes chemisorbing a first dielectric material on a substrate and chemisorbing a second dielectric material on the first material, one of the first and second dielectric materials comprising oxygen and a Group IB to VIIIB element. An enhanced dielectric material can be formed containing the first and second dielectric materials. The enhanced dielectric can exhibit a dielectric constant greater than that of the first dielectric material.

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Please replace paragraph [0030] with the following replacement paragraph:

[0030] According to yet another aspect of the invention, a dielectric material forming method includes atomic layer depositing an oxide of Group IVB metal on a first dielectric material containing $[[TA_2O_5]]$ Ta₂O₅ and forming a second dielectric material containing the chemisorbed oxide and the first dielectric material. As one example, the atomic layer depositing can include chemisorbing at least one Group IVB metal precursor on the first dielectric material followed by purging chemisorption byproducts and excess metal precursor from over the substrate. Exemplary precursors include tetrakis dimethyl amido titanium (TDMAT), zirconium t-butoxide, and other suitable materials as known to those skilled in the art. The metal precursors can be used alone or in combination. For example, titanium and zirconium could be deposited together. In processes where tantalum oxide is also formed by atomic layer depositing, tantalum ethoxy (Taeto) is one example of potentially several suitable precursors.

Please replace paragraph [0031] with the following replacement paragraph:

[0031] The atomic layer depositing may further include chemisorbing an oxygen precursor on the chemisorbed Group IVB metal or tantalum and purging chemisorption byproducts and excess oxygen precursor from over the substrate. A chemisorption product of the Group IVB metal precursor and the oxygen precursor can comprise Group IVB metal oxide. A chemisorption product of the tantalum precursor and the oxygen precursor can comprise a tantalum oxide, for example, $[[TA_2O_5]]$ Ta₂O₅. H₂O is one example of potentially several suitable oxygen precursors. However, a more preferable oxygen precursor will be of a type that does not oxidize silicon during ALD.

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Please replace paragraph [0040] with the following replacement paragraph:

[0040] Fig. 4 shows XPS spectral regions of the surface and in the bulk of the film analyzed to produce Fig. 3. The peak of ~~solid~~ dashed line 20 evidences the presence of 1s carbon orbitals at the surface while ~~dashed~~ solid line 22 evidences carbon contamination below detection limits in the film bulk.

Please replace paragraph [0041] with the following replacement paragraph:

[0041] Fig. 5 shows XPS spectral regions for 1s oxygen orbitals at the surface by ~~solid~~ dashed line 24 and in the bulk by ~~dashed line 26,~~ solid line 25.

Please replace paragraph [0042] with the following replacement paragraph:

[0042] Fig. 6 shows XPS spectral regions of 4f tantalum orbitals evidencing Ta₂O₅ at the surface by ~~solid~~ dashed line 32. Other tantalum oxides and tantalum are evidenced in the film bulk by the two peaks of ~~dashed~~ solid line 30.